

GLUTARALDEHYDE

CAS Registry Number: 111-30-8



Molecular Formula: $\text{C}_5\text{H}_8\text{O}_2$

Glutaraldehyde is a pungent, colorless liquid which when heated to decomposition emits acrid smoke. It is soluble in water, alcohol, benzene, and ether, and is volatile in steam. Glutaraldehyde polymerizes in water to a glassy foam (HSDB, 1993).

Physical Properties of Glutaraldehyde

Synonyms: Cidex; Glutarol; 1,5 pentanedione; pentanedial; glutaric dialdehyde

Molecular Weight:	100.13
Boiling Point:	188 °C at 760 mm Hg
Vapor Density:	3.4 (Air = 1)
Density:	0.72
Vapor Pressure:	17 mm Hg at 20 °C
Conversion Factor:	1 ppm = 4.1 mg/m ³

(HSDB, 1993; Sax, 1987)

SOURCES AND EMISSIONS

A. Sources

Glutaraldehyde is used as an embalming fluid, a chemical intermediate, a fixative for tissues, for crosslinking protein and polyhydroxy materials, and tanning of soft leathers (Sax, 1987).

Glutaraldehyde is registered as an antimicrobial and as a bactericide, a fungicide and a virucide. It is used to sterilize and disinfect hospital and veterinary equipment, and to disinfect surfaces in hospitals, veterinary hospitals, nursing homes, and food processing plants. Glutaraldehyde is used for disinfecting oil drilling muds, secondary oil recovery water systems, and ore processing water systems. It is also used to prevent bacterial growth in water supplies for washing air, water-washer cooler systems, industrial, commercial and logging ponds, and in pulp/paper mill water systems (DPR, 1996).

The licensing and regulation of pesticides for sale and use in California are the responsibility of the Department of Pesticide Regulation (DPR). Information presented in this fact sheet regarding the permitted pesticidal uses of glutaraldehyde has been collected from pesticide labels registered

for use in California and from DPR's pesticide databases. This information reflects pesticide use and permitted uses in California as of October 15, 1996. For further information regarding the pesticidal uses of this compound, please contact the Pesticide Registration Branch of DPR (DPR, 1996).

The primary stationary sources that have reported emissions of glutaraldehyde in California are crude petroleum and natural gas extraction, beverage manufacturers, and national security installations (ARB, 1997b).

B. Emissions

The total emissions of glutaraldehyde from stationary sources in California are estimated to be at least 22,000 pounds per year, based on data reported under the Air Toxics "Hot Spots" Program (AB 2588) (ARB, 1997b).

C. Natural Occurrence

No information about the natural occurrence of glutaraldehyde was found in the readily-available literature.

AMBIENT CONCENTRATIONS

No Air Resources Board data exist for ambient measurements of glutaraldehyde.

INDOOR SOURCES AND CONCENTRATIONS

No information about the indoor sources and concentrations of glutaraldehyde was found in the readily-available literature.

ATMOSPHERIC PERSISTENCE

Glutaraldehyde will exist in the atmosphere in the gas phase. The only important chemical loss process for glutaraldehyde in the troposphere is reaction with the hydroxyl (OH) radical. The calculated half-life and lifetime of glutaraldehyde due to reaction with the OH radical are 10 hours and 14 hours, respectively (Atkinson, 1989).

AB 2588 RISK ASSESSMENT INFORMATION

The Office of Environmental Health Hazard Assessment reviews risk assessments submitted under the Air Toxics "Hot Spots" Program (AB 2588). Of the risk assessments reviewed as of December 1996, glutaraldehyde was not listed in any of the risk assessments (OEHHA, 1996a,b).

HEALTH EFFECTS

Probable routes of human exposure to glutaraldehyde are inhalation, ingestion, and dermal contact.

Non-Cancer: Acute exposure to glutaraldehyde from contact with vapor, liquid, or mist can result in sudden headaches and strong irritation of the eyes, nose, throat and lungs (Sittig, 1991). Ingestion may result in gastrointestinal symptoms including abdominal pain, cramps, vomiting, diarrhea, and/or a burning sensation in the chest. More serious effects are vascular collapse and coma (HSDB, 1995). Sensitization can occur after repeated exposure of the skin to glutaraldehyde resulting in allergic contact dermatitis (HESIS, 1990).

A chronic non-cancer Reference Exposure Level (REL) of 1.7 micrograms per cubic meter is listed for glutaraldehyde in the California Air Pollution Control Officers Association Air Toxics “Hot Spots” Program, Revised 1992 Risk Assessment Guidelines. The toxicological endpoint considered for chronic toxicity is the respiratory system (CAPCOA, 1993). The United States Environmental Protection Agency (U.S. EPA) has not established a Reference Concentration (RfC) or an oral Reference Dose (RfD) for glutaraldehyde (U.S. EPA, 1995a).

Cancer: The International Agency for Research on Cancer and the U.S. EPA have not classified glutaraldehyde as to its carcinogenic potential (IARC, 1987a; U.S. EPA, 1995a).

